

0061244

SAF-B02-063
100 K Area - Full Protocol
FINAL DATA PACKAGE

E:MAIL RESULTS TO:

Mark Buckmaster

N/A
INITIAL/DATE

Mike Stankovich

NA
INITIAL/DATE

COMPLETE COPY OF DATA PACKAGE TO:

Mark Buckmaster X3-16

MB 1.13.04
INITIAL/DATE

Mike Stankovich H9-02

MS 1.13.04
INITIAL/DATE

Jeanette Duncan

JD 1.13.04
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE COVER SHEET)

SDG W04221

SAF-B02-063

Rad only

Chem only

X Rad & Chem

X Complete

Partial

Waste Site: 116-K-1

RECEIVED
FEB 05 2004
EDMC

SEVERN
TRENT

STL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

PROJECT NO. 100K AREA

B02-063

Lot #: F3L060148
SDG #: W04221

Joan Kessner

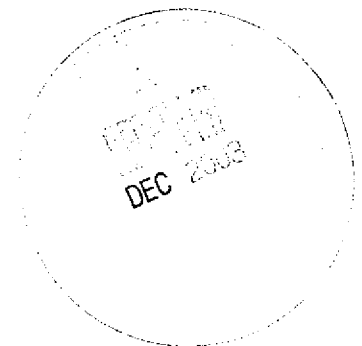
Bechtel Hanford, Inc.
3350 George Washington Way
MSIN HO-25
Richland, WA 99352

SEVERN TRENT LABORATORIES, INC.



MARTI WARD
Project Manager

December 11, 2003





STL

December 11, 2003

STL LOT NUMBER: F3L060148
SDG: W04221

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

Joan Kessner
Bechtel Hanford, Inc.
3350 George Washington Way
MSIN HO-25
Richland, WA 99352

Dear Joan Kessner,

This report contains the analytical results for the sample received under chain of custody by Severn Trent Laboratories (STL) on December 4, 2003. This sample is associated with your B02-063 SAF.

All applicable quality control procedures met method-specified acceptance criteria.

This report shall not be reproduced except in full, without the written approval of the laboratory. This report is incomplete without the Case Narrative. Results are reported "as received" (i.e. wet weight) unless otherwise noted.

If you have any questions, please feel free to call me at (314) 298-8566.

Sincerely,

Marti Ward
Project Manager

cc: Project File



SAMPLE SUMMARY

F3L060148

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
F56EQ	001	J01575	12/02/03	09:40

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

METHODS SUMMARY

F3L060148

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B	SW846 3050B

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

SDG W04221

STL ST. LOUIS

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B02-063-025		Page 1 of 1	
Collector Fahlberg	Company Contact M Stankovich	Telephone No. 531-7620		Project Coordinator KESSNER, JH		Price Code 8B		Data Turnaround 21 Days	
Project Designation 100 K Area - Full Protocol		Sampling Location 116-K-1 Shallow Zone		SAF No. B02-063		Air Quality		7 days	
Ice Chest No. ERC-01-021		Field Logbook No. EL 1572-1		COA R116K12600		Method of Shipment Government Vehicle		FED EX	
Shipped To Savern Trent Incorporated, Richmond		Offsite Property No. A040 062		Bill of Lading/Air Bill No. SEE OSPC					
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive		Preservation		None					
Special Handling and/or Storage Cool 4c		Type of Container		AG					
		No. of Container(s)		1					
		Volume		60mL					
SAMPLE ANALYSIS		See item (1) in Special Instructions		Chromium Hex - 71%		See item (2) in Special Instructions		Strontium- 89,90 - Total Sr, Mischmetal, Carbon-14 11-19-03	
Sample No.	Matrix *	Sample Date	Sample Time						
J01575	SOIL	12-2-03	0940	X	X	X	log		
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From R. Fahlberg		Date/Time 12-2-03 1000		Received By/Stored In JA 3725		Date/Time 12-02-02		S=Soil SE=Soil/Env SD=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DH=Drum Liquid T=Truck WT=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From JA 3725		Date/Time 12-4-03 1000		Received By/Stored In S. GALE		Date/Time 12-4-03 1000			
Relinquished By/Removed From S. GALE		Date/Time 12-4-03 1000		Received By/Stored In FED EX		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By AMCC		Title Sample Control		Date/Time 12/5/03 1100			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time			

Lot No.: F3L060148
W04221Condition Upon Receipt Form
St. Louis LaboratoryClient: RichlandDate: 12/5/03 Time: 0100Quote No: 56074Initiated by: AMShipper/No: FedEx 79098626930, 790524656499COC/RFA Numbers: JOH-007-13, W04-011-05
B02-063-025

Condition/Variance (Circle "Y" for yes and "N" for no. If "N" is circled, see notes for explanation):

1. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received in undamaged condition.	5. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample volume sufficient for analysis.
2. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received within $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Record temperature: <u>29C ambient</u>	6. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received with Chain of Custody.
3. <input checked="" type="radio"/> Y <input type="radio"/> N N/A	Sample received with proper pH**.	7. <input checked="" type="radio"/> Y <input type="radio"/> N	Chain of Custody matches sample IDs on containers.
4. <input checked="" type="radio"/> Y <input type="radio"/> N	Sample received in proper containers.	8. <input checked="" type="radio"/> Y <input type="radio"/> N	Custody seal received intact and tamper evident on cooler.
		9. <input checked="" type="radio"/> Y <input type="radio"/> N	Custody seal received intact and tamper evident on bottles.

* Temperature Variance Does Not Affect the Following Analyses: Metals 4/63

** For DOE-AL (Pantex, LANL, Sandia, Timet) sites, remember to pH all containers received, except for VOA, TOX, and soils.

Notes: Chain B02-063⁰⁶ was received at ambient temperature; tracking
#790524656499.

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor (or designate) Review: AMCawDate: 12/5/03Project Management Review: MurphyDate: 12/9/03

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE
THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED
IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR
INITIALS AND THE DATE NEXT TO THAT ITEM

7681

SL-ADMIN-0004, Revised 6/5/03
\\Qstlmo05\QA\FORMS\ST-LOUIS\ADMIN\ADMIN004_rev6_05_03.doc

LOT# F3L060148

SDG W04221

METALS

STL ST. LOUIS

BECHTEL HANFORD, INC.

Client Sample ID: J01575

TOTAL Metals

Lot-Sample #...: F3L060148-001

Matrix.....: SOLID

Date Sampled...: 12/02/03

Date Received...: 12/04/03

% Moisture.....: 5.2

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>WORK</u> <u>ORDER #</u>
Prep Batch #...: 3342223						
Chromium	9.1 J	1.1	mg/kg	SW846 6010B	12/08-12/09/03	F56EQ1AD
		Dilution Factor: 1		MDL.....: 0.059		

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #....: F3L060148

Matrix.....: SOLID

Date Sampled....: 12/02/03

Date Received...: 12/04/03

PARAMETER	AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: F3L060148-001 Prep Batch #....: 3342223									
% Moisture.....: 5.2									
Chromium									
	9.1	21.1	28.8	mg/kg	93		SW846 6010B	12/08-12/09/03	F56EQ1AE
	9.1	21.1	28.2	mg/kg	90	2.3	SW846 6010B	12/08-12/09/03	F56EQ1AF
Dilution Factor: 1									

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: F3L060148

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
MB Lot-Sample #: F3L080000-223 Prep Batch #...: 3342223						
Chromium	0.11 B	1.0	mg/kg	SW846 6010B	12/08-12/09/03	F57JQ1AA
Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE DATA REPORT

TOTAL Metals

Client Lot #...: F3L060148

Matrix.....: SOLID

<u>PARAMETER</u>	<u>SPIKE AMOUNT</u>	<u>MEASURED AMOUNT</u>	<u>UNITS</u>	<u>PERCENT RECVRY</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#: F3L080000-223 Prep Batch #...: 3342223							
Chromium	167	164	mg/kg	98	SW846 6010B	12/08-12/09/03	F57JQ1AC
Dilution Factor: 1							

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Analytical Data Package Prepared For

Bechtel Hanford

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland Wa, 99352, (509)-375-3131.

Assigned Laboratory Code: STLRL

Data Package Contains 31 Pages

Report No.: 24517

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
W04221	B02-063	J01575	J3L050138-1	F53LV1AA	9F53LV10	3345586
		J01575	J3L050138-1	F53LV1AE	9F53LV10	3346318
		J01575	J3L050138-1	F53LV1AC	9F53LV10	3346319



STL Richland
2800 George Washington Way
Richland, WA 99352

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

December 26, 2003

Attention: Joan Kessner

SAF Number	:	B02-063
Date SDG Closed	:	December 4, 2003
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W04202 ²¹ SRS 12/29/03
Data Deliverable	:	21-Day / Summary

CASE NARRATIVE

I. Introduction

On December 4, 2003, one soil sample was received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the sample was assigned the following laboratory ID number to correspond with the Bechtel Hanford, Inc. (BHI) specific ID:

<u>BHI ID#</u>	<u>STLR ID#</u>	<u>MATRIX</u>	<u>DATE OF RECEIPT</u>
J01575	F53LV	SOIL	12/4/03

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.



The requested analyses were:

Gas Proportional Counting

Total Strontium by method RICH-RC-5006

Gamma Spectroscopy

Gamma Spec by method RICH-RC-5017

Chemical Analyses

Hexavalent Chromium by EPA method 7196A

IV. Quality Control

The analytical results for each analysis performed under SDG W04221 includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

V. Comments

Gas Proportional Counting

Total Strontium by method RICH-RC-5006:

The LCS, batch blank, sample and sample duplicate (J01575) results are within contractual requirements.

Gamma Spectroscopy

Gamma Spec by method RICH-RC-5017:

There was insufficient sample received to analyze a separate duplicate sample fraction, therefore the precision determination was performed by recounting the sample aliquot on a separate detector. The Ra-228 recovery in the LCS was outside acceptance criteria. Although it is suspected to be out of limits due to counting statistics, the analysis will be monitored. Except as noted, the LCS, batch blank, sample and sample duplicate (J01575) results are within contractual requirements.

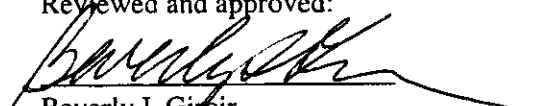
Chemical Analyses

Hexavalent Chromium by EPA method 7196A:

The sample matrix spike recovery was slightly low (73%), inhomogeneity of the matrix was confirmed upon reanalysis. Except as noted, the LCS, batch blank, sample, sample duplicate (J01575) and sample matrix spike (J01575) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:


Beverly I. Girbir
Project Manager

Drinking Water Method Cross References

DRINKING WATER ASTM METHOD CROSS REFERENCES		
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, $R = \text{constants} * f(x, y, z, \dots)$. The components (x, y, z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1, 2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/\sqrt{n}), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) <i>u_c - Combined Uncertainty.</i>	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, <i>u_c the combined uncertainty</i> . The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. $Lc = (1.645 * \sqrt{2 * (BkgrndCnt / BkgrndCntMin) / SCntMin}) * (ConvFct / (Eff * Yld * Abn * Vol) * IngrFct)$. For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. $MDC = (4.65 * \sqrt{(BkgrndCnt / BkgrndCntMin) / SCntMin} + 2.71 / SCntMin) * (ConvFct / (Eff * Yld * Abn * Vol) * IngrFct)$. For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = $(S-D) / [\sqrt{TPUs^2 + TPUD^2}]$ as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUD is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 29-Dec-03

STL Richland STLRL

Ordered by Method, Batch No., Client Sample ID.

Report No. : 24517

SDG No: W04221

Batch	Client Id Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RPD
3346318 GAMMA_GS									
J01575									
	F53LV1AE	CO-60	7.27E-03 +- 1.4E-02	U	pCi/g		2.42E-02	5.00E-02	
		CS-137	2.37E-01 +- 4.0E-02		pCi/g		2.06E-02	1.00E-01	
		EU-152	1.62E-01 +- 5.4E-02	U	pCi/g		6.25E-02	1.00E-01	
		EU-154	3.14E-02 +- 4.8E-02	U	pCi/g		8.40E-02	1.00E-01	
		EU-155	2.44E-02 +- 3.3E-02	U	pCi/g		5.49E-02	1.00E-01	
J01575 DUP									
	F53LV1AJ	CO-60	-1.44E-03 +- 9.6E-03	U	pCi/g		1.65E-02	5.00E-02	
		CS-137	2.10E-01 +- 3.2E-02		pCi/g		1.56E-02	1.00E-01	
		EU-152	1.42E-01 +- 4.0E-02	U	pCi/g		4.55E-02	1.00E-01	
		EU-154	-5.47E-03 +- 3.1E-02	U	pCi/g		5.25E-02	1.00E-01	
		EU-155	4.47E-02 +- 2.6E-02	U	pCi/g		4.36E-02	1.00E-01	
3346319 SRTOT_SEP_PRECIP_GPC									
J01575									
	F53LV1AC	STRONTIUM	1.09E+00 +- 5.6E-01		pCi/g	81%	8.66E-01		
J01575 DUP									
	F53LV1AK	STRONTIUM	1.66E-01 +- 3.8E-01	U	pCi/g	75%	8.61E-01		
3345586 7196_CR6									
J01575									
	F53LV1AA	HEXCHROME	3.50E-01 +- 0.0E+00	U	mg/kg	N/A	3.50E-01	3.50E-01	
J01575 DUP									
	F53LV1AG	HEXCHROME	3.50E-01 +- 0.0E+00	U	mg/kg	N/A	3.50E-01	3.50E-01	0.0
No. of Results: 14									

STL Richland

RPD - Relative Percent Difference.

rptSTLRichSaSum
mary2 V4.05 A97

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

QC Results Summary
STL Richland STLRL
 Ordered by Method, Batch No, QC Type,.

Date: 29-Dec-03

Report No. : 24517

SDG No.: W04221

Batch	Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC MDA
GAMMA_GS									
3346318 BLANK QC									
	F6JQ61AA	CO-60	4.47E-03 +- 3.6E-03	U	pCi/g				7.82E-03
		CS-137	7.09E-04 +- 3.3E-03	U	pCi/g				6.16E-03
		EU-152	2.18E-03 +- 8.6E-03	U	pCi/g				1.53E-02
		EU-154	-2.12E-03 +- 8.4E-03	U	pCi/g				1.53E-02
		EU-155	8.69E-03 +- 1.0E-02	U	pCi/g				1.83E-02
3346318 LCS									
	F6JQ61AC	CS-137	3.20E-01 +- 5.4E-02		pCi/g		109%	0.1	3.06E-02
		K-40	1.99E+01 +- 2.5E+00		pCi/g		102%	0.0	1.92E-01
		RA-226	1.05E+00 +- 1.5E-01		pCi/g		91%	-0.1	4.76E-02
		RA-228	2.57E+00 +- 3.7E-01		pCi/g		137%	0.4	1.10E-01
		U-238DHP	9.93E-01 +- 4.9E-01		pCi/g		94%	-0.1	5.68E-01
SRTOT_SEP_PRECIP_GPC									
3346319 BLANK QC									
	F6JQ71AA	STRONTIUM	-2.69E-02 +- 5.0E-02	U	pCi/g	88%			1.29E-01
3346319 LCS									
	F6JQ71AC	STRONTIUM	1.12E+00 +- 3.2E-01		pCi/g	91%	98%	0.0	1.25E-01
7196_CR6									
3345586 MATRIX SPIKE									
	F53LV1AF	HEXCHROME	3.06E+01 +- 0.0E+00		mg/kg	N/A	73%	-0.3	3.50E-01
3345586 LCS									
	F6HEW1AC	HEXCHROME	3.76E+01 +- 0.0E+00		mg/kg	N/A	94%	-0.1	3.50E-01
3345586 BLANK QC									
	F6HEW1AA	HEXCHROME	3.50E-01 +- 0.0E+00	U	mg/kg	N/A			3.50E-01
No. of Results: 15									

STL Richland Bias - (Result/Expected)-1 as defined by ANSI N13.30.
 rptSTLRchQcSummary V4.05 A97 U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

Date: 29-Dec-03

SAMPLE RESULTS

Lab Name: STL Richland

SDG: W04221

Collection Date: 12/2/2003 9:40:00 AM

Lot-Sample No.: J3L050138-1

Report No.: 24517

Received Date: 12/4/2003 2:35:00 PM

Client Sample ID: J01575

COC No.: B02-063-025

Matrix: SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC(MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3345586	7196_CR6				Work Order: F53LV1AA		Report DB ID: 9F53LV10					
HEXCHROME	3.50E-01	U		0.0E+00	3.50E-01	mg/kg	N/A	(1.)	12/12/03		2.5	
							3.50E-01	N/A			G	
Batch: 3346318	GAMMA_GS				Work Order: F53LV1AE		Report DB ID: 9F53LV10					
CO-60	7.27E-03	U	1.4E-02	1.4E-02	2.42E-02	pCi/g	5.00E-02	(1.1)	12/15/03 11:03 a		866.7	GER6\$1
											g	
CS-137	2.37E-01		4.0E-02	4.0E-02	2.06E-02	pCi/g	1.00E-01	(11.5)	12/15/03 11:03 a		866.7	GER6\$1
								(12.)			g	
EU-152	1.62E-01	U	5.4E-02	5.4E-02	6.25E-02	pCi/g	1.00E-01	(2.6)	12/15/03 11:03 a		866.7	GER6\$1
								(6.)			g	
EU-154	3.14E-02	U	4.8E-02	4.8E-02	8.40E-02	pCi/g	1.00E-01	0.37	12/15/03 11:03 a		866.7	GER6\$1
								(1.3)			g	
EU-155	2.44E-02	U	3.3E-02	3.3E-02	5.49E-02	pCi/g	1.00E-01	0.44	12/15/03 11:03 a		866.7	GER6\$1
								(1.5)			g	
Batch: 3346319	SRTOT_SEP_PRECIP_GPC				Work Order: F53LV1AC		Report DB ID: 9F53LV10					
STRONTIUM	1.09E+00		4.8E-01	5.6E-01	8.66E-01	pCi/g	81%	(1.3)	12/23/03 05:42 a		1.01	GPC26A
							4.03E-01	(3.9)			G	

No. of Results: 7

Comments:

00

FORM II

Date: 29-Dec-03

DUPLICATE RESULTS

Lab Name: STL Richland

SDG: W04221

Collection Date: 12/2/2003 9:40:00 AM

Lot-Sample No.: J3L050138-1

Report No.: 24517

Received Date: 12/4/2003 2:35:00 PM

Client Sample ID: J01575 DUP

COC No.: B02-063-025

Matrix: SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2s)	Total Uncert(2s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3345586	7196_CR6			Work Order: F53LV1AG		Report DB ID: F53LV1GR		Orig Sa DB ID: 9F53LV10				
HEXCHROME	3.50E-01	U		0.0E+00	3.50E-01	mg/kg	N/A	(1.)	12/12/03		2.5	
	3.50E-01	U	RPD	0.0		3.50E-01		N/A			G	
Batch: 3346318	GAMMA_GS			Work Order: F53LV1AJ		Report DB ID: F53LV1JR		Orig Sa DB ID: 9F53LV10				
CO-60	-1.44E-03	U	9.6E-03	9.6E-03	1.65E-02	pCi/g		-0.09	12/15/03 02:27 p		866.7	GER8\$1
	7.27E-03	U	RPD	299.1		5.00E-02		-0.3			g	
CS-137	2.10E-01		3.2E-02	3.2E-02	1.56E-02	pCi/g		(13.5)	12/15/03 02:27 p		866.7	GER8\$1
	2.37E-01		RPD	12.3		1.00E-01		(13.2)			g	
EU-152	1.42E-01	U	4.0E-02	4.0E-02	4.55E-02	pCi/g		(3.1)	12/15/03 02:27 p		866.7	GER8\$1
	1.62E-01	U	RPD	13.1		1.00E-01		(7.1)			g	
EU-154	-5.47E-03	U	3.1E-02	3.1E-02	5.25E-02	pCi/g		-0.1	12/15/03 02:27 p		866.7	GER8\$1
	3.14E-02	U	RPD	284.4		1.00E-01		-0.36			g	
EU-155	4.47E-02	U	2.6E-02	2.6E-02	4.36E-02	pCi/g		(1.)	12/15/03 02:27 p		866.7	GER8\$1
	2.44E-02	U	RPD	58.8		1.00E-01		(3.5)			g	
Batch: 3346319	SRTOT_SEP_PRECIP_GPC			Work Order: F53LV1AK		Report DB ID: F53LV1KR		Orig Sa DB ID: 9F53LV10				
STRONTIUM	1.66E-01	U	3.8E-01	3.8E-01	8.61E-01	pCi/g	75%	0.19	12/23/03 05:42 a		1.02	GPC26B
	1.09E+00		RPD	147.3				0.87			G	

No. of Results: 7 Comments:

STL Richland

RPD - Relative Percent Difference.

rptSTLRchDupV4.
05 A97

MDC|MDA, Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II **BLANK RESULTS**

Date: 29-Dec-03

Lab Name: STL Richland

SDG: W04221

Matrix: SOIL

Report No. : 24517

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3345586	7196_CR6				Work Order: F6HEW1AA	Report DB ID: F6HEW1AB						
HEXCHROME	3.50E-01	U		0.0E+00	3.50E-01	mg/kg	N/A	(1.)	12/12/03		2.5	
						3.50E-01		N/A			G	
Batch: 3346318	GAMMA_GS				Work Order: F6JQ61AA	Report DB ID: F6JQ61AX						
CO-60	4.47E-03	U	3.6E-03	3.6E-03	7.82E-03	pCi/g		0.57	12/15/03 11:04 a		859.27	GER7\$1
						5.00E-02		(2.5)			g	
CS-137	7.09E-04	U	3.3E-03	3.3E-03	6.16E-03	pCi/g		0.12	12/15/03 11:04 a		859.27	GER7\$1
						1.00E-01		0.42			g	
EU-152	2.18E-03	U	8.6E-03	8.6E-03	1.53E-02	pCi/g		0.14	12/15/03 11:04 a		859.27	GER7\$1
						1.00E-01		0.51			g	
EU-154	-2.12E-03	U	8.4E-03	8.4E-03	1.53E-02	pCi/g		-0.14	12/15/03 11:04 a		859.27	GER7\$1
						1.00E-01		-0.5			g	
EU-155	8.69E-03	U	1.0E-02	1.0E-02	1.83E-02	pCi/g		0.48	12/15/03 11:04 a		859.27	GER7\$1
						1.00E-01		(1.7)			g	
Batch: 3346319	SRTOT_SEP_PRECIP_GPC				Work Order: F6JQ71AA	Report DB ID: F6JQ71AB						
STRONTIUM	-2.69E-02	U	5.0E-02	5.0E-02	1.29E-01	pCi/g	88%	-0.21	12/23/03 05:42 a		6.0	GPC26C
					5.95E-02			-(1.1)			G	

No. of Results: 7 Comments:

10

FORM II LCS RESULTS

Date: 29-Dec-03

Lab Name: STL Richland

SDG: W04221

Matrix: SOIL

Report No. : 24517

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 3345586	7196_CR6					Work Order: F6HEW1AC		Report DB ID: F6HEW1AS					
HEXCHROME	3.76E+01			0.0E+00	3.50E-01	mg/kg	N/A	4.00E+01		94%	12/12/03	2.5	
							Rec Limits:	80	120	-0.1		G	
Batch: 3346318	GAMMA_GS					Work Order: F6JQ61AC		Report DB ID: F6JQ61CM					
CS-137	3.20E-01		5.4E-02	5.4E-02	3.06E-02	pCi/g		2.93E-01	1.3E-02	109%	12/15/03 11:04 a	457.79	GER8\$1
							Rec Limits:	70	130	0.1		g	
K-40	1.99E+01		2.5E+00	2.5E+00	1.92E-01	pCi/g		1.95E+01	1.3E-02	102%	12/15/03 11:04 a	457.79	GER8\$1
							Rec Limits:	70	130	0.0		g	
RA-226	1.05E+00		1.5E-01	1.5E-01	4.76E-02	pCi/g		1.15E+00	5.2E-02	91%	12/15/03 11:04 a	457.79	GER8\$1
							Rec Limits:	70	130	-0.1		g	
RA-228	2.57E+00		3.7E-01	3.7E-01	1.10E-01	pCi/g		1.87E+00	9.6E-02	137%	12/15/03 11:04 a	457.79	GER8\$1
							Rec Limits:	70	130	0.4		g	
U-238DHP	9.93E-01		4.9E-01	4.9E-01	5.68E-01	pCi/g		1.05E+00	5.4E-02	94%	12/15/03 11:04 a	457.79	GER8\$1
							Rec Limits:	70	130	-0.1		g	
Batch: 3346319	SRTOT_SEP_PRECIP_GPC					Work Order: F6JQ71AC		Report DB ID: F6JQ71CS					
STRONTIUM	1.12E+00		1.4E-01	3.2E-01	1.25E-01	pCi/g	91%	1.14E+00	1.4E-02	98%	12/23/03 05:42 a	6.0	GPC26D
							Rec Limits:	20	105	0.0		G	
No. of Results: 7 Comments:													

11

FORM II
MATRIX SPIKE RESULTS

Date: 29-Dec-03

Lab Name: STL Richland

SDG: W04221

Lot-Sample No.: J3L050138-1

Report No. : 24517

Matrix: SOIL

Parameter	SpikeResult, Orig Rst	Qual	Count Error (2s)	Total Uncert(2s)	MDC/MDA	Rpt Unit, CRDL	Yield	Rec-very	Exp-ected	Exp Uncert	Analysis, Prep Date	Allquot Size	Primary Detector
Batch: 3345586	7196_CR6				Work Order: F53LV1AF	Report DB ID: F53LV1FW	Orig Sa DB ID: 9F53LV10						
HEXCHROME	3.06E+01			0.0E+00	3.50E-01	mg/kg	N/A	72.66%	4.22E+01		12/12/03	2.5	
	3.50E-01	RPD	195.5									G	
No. of Results: 1	Comments:												

12

Data Review Checklist
RADIOCHEMISTRY
First Level Review

P

Lot Number: 13L050B8
Client ID: BH1
Due Date: 12/26/03
QC Batch Number: 3346378
Method Test Parameter: TA - 1
Matrix: SEL
SDG Number: W04221

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	✓		
2. Are the QC appropriate for the analysis included in the batch?	✓	✓	
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?			✓
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	✓		
2. Is the LCS result, yield and MDA within contract limits?	✓	✓	
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data			
1. Were results calculated in the correct units?	✓		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?			✓
4. Were spectra reviewed/meet contractual requirements?	✓		
5. Were raw counts reviewed for anomalies?			✓
E. Other			
1. Are all Nonconformances included and noted? <u>10-01466</u>	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: _____

First Level Review: Chad L. HillDate: 12-28-03



STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: _____

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?			✓
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓	✓	
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓	✓	
C. Other			
1. Are all Nonconformances included and noted?	✓		
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

See NCM

Second Level Review: _____

Date: _____

12-18-03

Clouseau Nonconformance Memo

SEVERN
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NCM #: **10-01466**
NCM Initiated By: Dale O'Connell
Date Opened: 12/18/2003
Date Closed:

Classification: **Anomaly**
Status: **PMREVIEW**
Production Area: Environmental - Prep
Tests: Gamma by GER
Lot #'s (Sample #'s): J3L050138 (1), J3L120000 (318),
QC Batches: 3346318

Nonconformance: Insufficient sample volume for QC
Subcategory: Other (explanation required)

Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Dale O'Connell	12/18/2003	Insufficient sample to generate a duplicate.

Possible False Positive: Although key-line activity > MDA, identification of radionuclide rejected by abundance criteria.

Ra-228 recovery out of limits for the LCS. Cause is possibly counting statistics, will monitor.

Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Dale O'Connell	12/18/2003	Precision determination achieved by recounting sample on a different detector. Report results.

Client Notification Summary

<u>Client</u>	<u>Project Manager</u>	<u>Notified</u>	<u>Response</u>	<u>How Notified</u>	<u>Note</u>
			<u>Response</u>		<u>Response Note</u>

Quality Assurance Verification

<u>Verified By</u>	<u>Due Date</u>	<u>Status</u>	<u>Notes</u>
		This section not yet completed by QA.	

Approval History

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>
----------------------	--------------------	-----------------

Data Review Checklist
RADIOCHEMISTRY
First Level ReviewLot Number: J3L050138Client ID: BHIDue Date: 12/26/2003QC Batch Number: 3346319Method Test Parameter: TH TOTAL STRONTIUMMatrix: SoilSDG Number: W04221

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. COC			
1. Is the ICOC page complete (includes all applicable analysts, dates, SOP numbers and revisions)?	✓		
B. QC Batch			
1. Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	—		
2. Are the QC appropriate for the analysis included in the batch?	—		
3. Is the Analytical Batch Worksheets complete (includes, as appropriate, volumes, count times, etc.)?	✓		
4. Does the Worksheets include a Tracer Vial label for each sample?	✓		
C. QC & Samples			
1. Is the blank result, yield and MDA within contract limits?	—		
2. Is the LCS result, yield and MDA within contract limits?	—		
3. Are the MS/MSD results, yields and MDAs within contract limits?			✓
4. Are the duplicate results, yields and MDAs within contract limits?	✓		
5. Are the sample yields and MDAs within contract limits?	✓		
D. Raw Data			
1. Were results calculated in the correct units?	—		
2. Were analysis volumes entered correctly?	✓		
3. Were yields entered correctly?	✓		
4. Were spectra reviewed/meet contractual requirements?			✓
5. Were raw counts reviewed for anomalies?	✓		
E. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Are worksheet entries complete and correct?	✓		

Comments on any "No" response: _____

First Level Review: Pam AndersonDate: 12-23-03




STL

Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number: 3 3 4 6 3 1 9

Review Item	Yes (✓)	No (✓)	N/A (✓)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?	✓		
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓		
3. Are the correct isotopes reported?	✓		
B. QC Samples			
1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓		
2. Does the blank result meet the Contract criteria?	✓		
3. Is the blank result < the Contract Detection Limit?	✓		
4. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓
5. Is the LCS recovery with contract acceptance criteria?	✓		
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓		
8. Do the MS/MSD results and yields meet acceptance criteria?			✓
9. Do the duplicate sample results and yields meet acceptance criteria?	✓		
C. Other			
1. Are all Nonconformances included and noted?			✓
2. Are all required forms filled out?	✓		
3. Was the correct methodology used?	✓		
4. Was transcription checked?	✓		
5. Were all calculations checked at a minimum frequency?	✓		
6. Were units checked?	✓		

Comments on any "No" response: _____

Second Level Review: 

Date: 12-26-03



STL

Richland Laboratory Data Review Check List METALS

Work Order Number(s): <u>W04251</u> <u>BATCH# 3345586</u>				
Lab Sample Numbers or SDG: <u>F53LV</u> <u>KICHLWC 5005-REV. 6</u>				
Method/Test/Parameter: <u>HEXA VALENT Chromium (OTHER Solid)</u>				
Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
A. Initial Calibration				
1. Performed at required frequency with required number of levels?	✓			✓
2. Correlation coefficient within QC limits?	✓			✓
3. Initial calibration verification (ICV) analyzed immediately after calibration and results within QC limits?	✓			✓
4. Initial calibration blank (ICB) analyzed immediately after ICV and concentrations of all parameters ≤ reporting limit?	✓			✓
B. Continuing Calibration				
1. CCV analyzed at required frequency and all parameters within QC limits?	✓			✓
2. CCB analyzed at required frequency and all results ≤ reporting limit?	✓			✓
C. Sample Analysis				
1. Were any samples with concentrations above the linear range for any parameter diluted and reanalyzed?		✓		✓
2. Were all sample holding times met?	✓			✓
D. QC Samples				
1. All results for the preparation blank below limits?	✓			✓
2. MS or MS/MSD recoveries within QC limits and %RPD (for MSD) acceptable?		✓		✓
3. LCS percent recovery within QC limits and %RPD (for LCSD) acceptable?	✓			✓
4. Analytical spikes within QC limits where applicable?		✓		✓
5. ICP only: One serial dilution performed per SDG?			✓	✓
6. ICP only: CRDL standard (CRI or CRA) analyzed at required frequency?			✓	✓
7. ICP only: Interference check samples (ICSA, ICSAB) and HICAL analyzed at the required frequencies and within QC limits?			✓	✓

Review Item	Yes (✓)	No (✓)	N/A (✓)	2 nd Level Review (✓)
E. Other				
1. Are all nonconformances included and noted? <u>10-01503</u>	✓			✓
2. Is the correct date and time of analysis shown?	✓			✓
3. Did the analyst sign and date the front page of the analytical run?	✓			✓
4. Correct methodology used?	✓			✓
5. Transcriptions checked?	✓			✓
6. Calculations checked at minimum frequency?	✓			✓
7. Units checked?	✓			✓

Comments on any "No" response:

ms was not within GC limits. — 12-12-03 NW

Analyst: N. Wins

Date: 12-12-03

Second-Level Review: W. L. Hill

Date: 12-15-03

Clouseau Nonconformance Memo

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NCM #: **10-01503**
NCM Initiated By: Dale O'Connell
Date Opened: 12/22/2003
Date Closed:

Classification: **Anomaly**
Status: **PMREVIEW**
Production Area: Classical Chemistry
Tests: 7196A
Lot #'s (Sample #'s): J3L050138 (1), J3L110000
(586), J3L150000 (625),
QC Batches: 3345586, 3349625

Nonconformance: QC data exceeded criteria
Subcategory: MS/MSD accuracy and/or precision out of control

Problem Description / Root Cause

<u>Name</u>	<u>Date</u>	<u>Description</u>
Dale O'Connell	12/22/2003	Initial analysis, soluble matrix spike out of limits, recovery low at 73%.

Corrective Action

<u>Name</u>	<u>Date</u>	<u>Corrective Action</u>
Dale O'Connell	12/22/2003	Matrix effect confirmed upon re-analysis, soluble matrix spike out of limits, recovery low at 64 %. Report results of first analysis.

Client Notification Summary

<u>Client</u>	<u>Project Manager</u>	<u>Notified</u>	<u>Response</u>	<u>How Notified</u>	<u>Note</u>
			<u>Response</u>		<u>Response Note</u>

Quality Assurance Verification

<u>Verified By</u>	<u>Due Date</u>	<u>Status</u>	<u>Notes</u>
			This section not yet completed by QA.

Approval History

<u>Date Approved</u>	<u>Approved By</u>	<u>Position</u>

CHAIN OF CUSTODY

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B02-063-025		Page <u>1</u> of <u>1</u>							
Collector Fahlberg		Company Contact M Stankovich		Telephone No. 531-7620		Project Coordinator KESSNER, JH		Price Code 83 Data Turnaround 21 Days							
Project Designation 100 K Area - Full Protocol		Sampling Location 116-K-1 Shallow Zone		SAF No. B02-063		Air Quality <input type="checkbox"/>									
Ice Chest No. ERC 99 022		Field Logbook No. EL 1572-1		COA R116K12600		Method of Shipment Government Vehicle									
Shipped To Severn Trent Incorporated, Richland		Offsite Property No. N/A		Bill of Lading/Air Bill No. N/A											
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Special Handling and/or Storage Cool 4c				Preservation	None	Cool 4C	None	None							
				Type of Container	aG	aG	P	aG							
				No. of Container(s)	1	1	1								
				Volume	60mL	60mL	1000mL	60mL							
SAMPLE ANALYSIS SD4 W04221 Due 12-26 J3LD50138				See item (1) in Special Instructions	Chromium Hex - 7196	See item (2) in Special Instructions	Strontium-89,90 - Total Sr, Nickel-63 Carbon-14 RF 11-19-03								
Sample No.	Matrix *	Sample Date	Sample Time												
J01575 F53LV	SOIL	12-2-03	0940	X	X	X	X								
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix * S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
R. Fahlberg		12-2-03		JA 3728		12-02-02									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
JA 3728		12-4-03 1000		JA 3728		12-4-03 1000									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
JA 3728		12-4-03 1435		JA 3728		12-4-03 1435									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
LABORATORY SECTION		Received By		Title				Date/Time							
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time							

DATA SHEET

SDG <u>7574</u>	Client/Case No. <u>Hanford</u>	SDG <u>H2322</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R308142-04</u>	Client sample id <u>J00WN8</u>	
Dept sample id <u>7574-004</u>	Location/Matrix: <u>116-K-1</u>	<u>SOLID</u>
Received <u>08/28/03</u>	Collected/Weight <u>08/21/03 09:55</u>	<u>1003 g</u>
% solids <u>99.9</u>	Custody/SAF No <u>B02-062-15</u>	<u>B02-062</u>

TEST	CAS NO	RESULT pCi/g	2σ RSD (%)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Total Strontium	SR-RAD	10.6	0.55	0.22	1.0		SR
Cobalt 60	10198-40-0	31.8	0.1	0.26	0.050		GAM
Cesium 137	10045-97-3	437	1.2	0.52	0.10		GAM
Am-241	14683-23-9	162	1		0.10		GAM
Europium 154	15585-10-1	25.1	0.96	0.86	0.10		GAM
Europium 155	14391-16-3	1.00	0.67	0.96	0.10		GAM
Am-241	14596-10-2	5.42	0.1	.51			GAM

100 K Area - Quick Turn

375-9745

DATA SHEET
Page 4
SUMMARY DATA SECTION
Page 15

Lab ID EDR1112
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 09/12/03

Sample Check-in List

Date/Time Received: 12-4-03 1435
Client: BHI SDG #: W0421 NA ☐ SAF #: B02-003 NA ☐
Work Order Number: J3L050138 Chain of Custody #: B02-003-025
Shipping Container ID: ERC 99 022 Air Bill #: 4

1. Custody Seals on shipping container intact? NA ☐ Yes ☐ No ☒
2. Custody Seals dated and signed? NA ☐ Yes ☐ No ☒
3. Chain of Custody record present? Yes ☒ No ☐
4. Cooler temperature: 4° NA ☒ 5. Vermiculite/packing materials is NA ☒ Wet ☐ Dry ☐
6. Number of samples in shipping container: 3
7. Sample holding times exceeded? NA ☐ Yes ☐ No ☒
8. Samples have:
☐ tape ☒ hazard labels
☒ custody seals ☒ appropriate samples labels
9. Samples are:
☒ in good condition ☐ leaking
☐ broken ☐ have air bubbles
(Only for samples requiring head space)
10. Sample pH taken? NA ☒ pH < 2 ☐ pH > 2 ☐ pH > 9 ☐
11. Sample Location, Sample Collector Listed? * Yes ☐ No ☒
*For documentation only. No corrective action needed.
12. Were any anomalies identified in sample receipt? Yes ☐ No ☒
13. Description of anomalies (include sample numbers): _____

Sample Custodian: StadelbergerDate: 12-4-03

Client Sample ID	Analysis Requested	Condition	Comments/Action

Client Informed on _____ by _____ Person contacted _____

☐ No action necessary; process as is.

Project Manager _____ Date _____

12/15/2003 10:24:32 AM

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.Sample Preparation/Analysis **PRIORITY**

Balance Id:1120421763

AX Gamma PrpRC5013/5017

TA Gamma by HPGE

SI CLIENT: HANFORD

Pipet #: *NA*

Report Due: 12/26/2003

Sep1 DT/Tm Tech:

Sep2 DT/Tm Tech:

Prep Tech: ,SCHERRT

Batch: 3346318 SOIL pCi/g PM, Quote: BG2, 27038

SEQ Batch, Test: None All Tests: 3345586 DWEA, 3345589 88OV, 3346318 AXTA, 3346319 CHTH,

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 F53LV-1-AE J3L050138-1-SAMP	866.7g,in									
12/02/2003 09:40	AmtRec: LG,2X60G	#Containers: 3								
2 F53LV-1-AJ-X J3L050138-1-DUP	866.7g,in									
12/02/2003 09:40	AmtRec: LG,2X60G	#Containers: 3								
3 F6JQ6-1-AA-B J3L120000-318-BLK	859.27g,in									
12/02/2003 09:40	AmtRec:	#Containers: 1								
4 F6JQ6-1-AC-C J3L120000-318-LCS	457.79g,in									
12/02/2003 09:40	AmtRec:	#Containers: 1								
12/02/2003 09:40	AmtRec:	#Containers: 1								

Comments: NOT ENOUGH sample recount DUP on different detector 12/15/03

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG2, 27038

F53LV1AE-SAMP Constituent List:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Eu-154	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-155	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:

F6JQ61AA-BLK:

Co-60	RDL:5.00E-02	pCi/g	LCL:	UCL:	RPD:	Cs-137	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:
Cs-137DA	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:	Eu-152	RDL:1.00E-01	pCi/g	LCL:	UCL:	RPD:

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2

Richland Wa. r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

12/18/03 9:45:32 AM

ICOC Fraction Transfer/Status Report

ByDate: 11/18/03, 12/19/03, Batch: '3346318', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
3346318				
AC	CalcC	SCHERRT	12/15/03 10:21:48	jwDone
SC		wagarr	IsBatched 12/12/03 11:00:06 AM	ICOC_RADCALC v4.708
SC		SCHERRT	InPrep 12/15/03 10:21:48 AM	RICH-RC-5013 REVISION 4
SC		SCHERRT	Prep1C 12/15/03 10:25:00 AM	RICH-RC-5013 REVISION 4
SC		BlackCL	InCnt1 12/15/03 10:58:07 AM	RICH-RD-0007 REVISION 4
SC		BlackCL	CalcC 12/15/03 5:53:39 PM	RICH-RD-0007 REVISION 4
AC		SCHERRT	12/15/03 10:25:00	
AC		BlackCL	12/15/03 10:58:07	
AC		BlackCL	12/15/03 5:53:39 PM	

AC: Accepting Entry; SC: Status Change

STL Richland
Richland Wa.

12/16/2003 8:45:21 PM

Sample Preparation/Analysis

PRIORITY

Balance Id:1120373922 ,#02

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.

CH Sr-Total PrpRC5013, SepRC5006

TH Total Strontium by GPC

Pipet #: NA

Report Due: 12/26/2003

W04221

SI CLIENT: HANFORD

Sep1 DT/Tm Tech: 12-22-03

3:18 PM

Batch: 3346319 SOIL

pCi/g

PM, Quote: BG2, 27038

Sep2 DT/Tm Tech: NA

SEQ Batch, Test: None

Prep Tech: ,WAGNERJ

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 F53LV-1-AC J3L050138-1-SAMP		1.01g,in	SRTA10262 08/07/03 05/29/03,r							
12/02/2003 09:40	(15)	AmtRec: LG,2X60G	#Containers: 3			81.5	56	JCB	0607	B/23/03
2 F53LV-1-AK-X J3L050138-1-DUP		1.02g,in	SRTA10263 08/07/03 05/29/03,r			75.2		JCB		
12/02/2003 09:40	(15)	AmtRec: LG,2X60G	#Containers: 3							
3 F6JQ7-1-AA-B J3L120000-319-BLK		6.0g,in	SRTA10264 08/07/03 05/29/03,r			87.9		JCB		
12/02/2003 09:40		AmtRec:	#Containers: 1							
4 F6JQ7-1-AC-C J3L120000-319-LCS		6.0g,in	STSB0818 11/13/03 09/11/03,r			91.0		JCB		
12/02/2003 09:40		AmtRec:	#Containers: 1							

Comments: Reduced aliquots targeted in parenthesis. 12-16-03

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG2, 27038

F53LV1AC-SAMP Constituent List:

Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35
F6JQ71AA-BLK:					
Sr-90	RDL:1	pCi/g	LCL:	UCL:	RPD:
F6JQ71AC-LCS:					
Sr-90	RDL:1	pCi/g	LCL:70	UCL:130	RPD:35

F53LV1AC-SAMP Calc Info:

STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2
Richland Wa. r - Reference date, ec-Enrichment Cell, ct-Cocktailed Added

12/23/03 2:34:08 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/23/03, 12/24/03, Batch: '3346319', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
3346319				
AC	CalcC	SCHERRT	12/15/03 10:22:00	jwDone
SC		wagarr	IsBatched 12/12/03 11:00:06 AM	ICOC_RADCALC v4.708
SC		SCHERRT	InPrep 12/15/03 10:22:00 AM	RICH-RC-5013 REVISION 4
SC		SCHERRT	Prep1C 12/15/03 10:22:18 AM	RICH-RC-5013 REVISION 4
SC		WAGNERJ	InPrep2 12/16/03 8:21:39 PM	RICH-RC-5013 REVISION 4
SC		WAGNERJ	Prep2C 12/18/03 9:58:29 AM	RICH-RC-5013 REVISION 4
SC		FABREM	InSep1 12/18/03 10:02:12 AM	RICH-RC-5006 REVISION 5
SC		FABREM	Sep1C 12/22/03 5:26:16 PM	RICH-RC-5006 REVISION 5
SC		DAWKINSO	InCnt1 12/22/03 6:31:30 PM	RICH-RD-0003 REVISION 3
SC		BlackCL	CalcC 12/23/03 7:12:05 AM	RICH-RD-0003 REVISION 3
AC		SCHERRT	12/15/03 10:22:18	jwDone
AC		WAGNERJ	12/16/03 8:21:39 PM	
AC		WAGNERJ	12/18/03 9:58:29 AM	
AC		FABREM	12/18/03 10:02:12	
AC		FABREM	12/22/03 5:26:16 PM	
AC		DAWKINSO	12/22/03 6:31:30 PM	
AC		BlackCL	12/23/03 7:12:05 AM	

AC: Accepting Entry, SC: Status Change

STL Richland

Richland Wa.

12/11/03 2:57:28 PM

Sample Preparation/Analysis

Balance Id:

127642, BECHTEL HANFORD, INC.
Bechtel Hanford, Inc.DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)
SI CLIENT: HANFORD

Pipet #: _____

Report Due: 12/26/2003

W04221

PRIORITY

Sep1 DT/Tm Tech:

Batch: 3345586

SOIL

mg/kg

PM, Quote: BG2, 27038

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
1 F53LV-1-AA										
J3L050138-1-SAMP										
12/02/2003 09:40		AmtRec: LG,2X60G	#Containers: 3					Scr Rst:	Alpha: 1.03E+02 pCi/g	Beta: 3.15E+01 pCi/g
2 F53LV-1-AF-S										
J3L050138-1-MS										
12/02/2003 09:40		AmtRec: LG,2X60G	#Containers: 3					Scr Rst:	Alpha: 1.03E+02 pCi/g	Beta: 3.15E+01 pCi/g
3 F53LV-1-AG-X										
J3L050138-1-DUP										
12/02/2003 09:40		AmtRec: LG,2X60G	#Containers: 3					Scr Rst:	Alpha: 1.03E+02 pCi/g	Beta: 3.15E+01 pCi/g
4 F53LV-1-AH-S										
J3L050138-1-MS										
12/02/2003 09:40		AmtRec: LG,2X60G	#Containers: 3					Scr Rst:	Alpha: 1.03E+02 pCi/g	Beta: 3.15E+01 pCi/g
5 F6HEW-1-AA-B										
J3L110000-586-BLK										
12/02/2003 09:40		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:
6 F6HEW-1-AC-C										
J3L110000-586-LCS										
12/02/2003 09:40		AmtRec:	#Containers: 1					Scr Rst:	Alpha:	Beta:

12/11/03 2:57:29 PM

Sample Preparation/Analysis

Balance Id:

DW Alkaline Digestion by method 3060A
EA Chromium, Hexavalent (7196A)

Pipet #:

Report Due: 12/26/2003

5I CLIENT: HANFORD

Sep1 DT/Tm Tech:

Batch: 3345586

mg/kg

Sep2 DT/Tm Tech:

SEQ Batch, Test: None

Prep Tech:

Work Order, Lot, Sample Date/Time	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	QC Vial 2 Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date
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Comments:

All Clients for Batch:

127642, BECHTEL HANFORD, INC.

Bechtel Hanford, Inc.

, BG2, 27038

F53LV1AA-SAMP Constituent List:

HEXCHROME RDL:0.35 mg/kg LCL:80 UCL:120 RPD:20

F53LV1AF-MS Constituent List:

HEXCHROME RDL:0.35 mg/kg LCL:75 UCL:125 RPD:20

F53LV1AH-MS:

HEXCHROME RDL:0.35 mg/kg LCL:75 UCL:125 RPD:20

F6HEW1AA-BLK:

HEXCHROME RDL:0.35 mg/kg LCL: UCL: RPD:

F6HEW1AC-LCS:

HEXCHROME RDL:0.35 mg/kg LCL:80 UCL:120 RPD:20

F53LV1AA-SAMP Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

F53LV1AF-MS Calc Info:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

F53LV1AH-MS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

F6HEW1AA-BLK:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

F6HEW1AC-LCS:

Uncert Level (#s): 2 Decay to SaDt: Y Blk Subt.: N Sci.Not.: Y ODRs: B

12/22/03 3:38:26 PM

ICOC Fraction Transfer/Status Report

ByDate: 11/22/03, 12/23/03, Batch: '3345586','3349625', User: *All Order by BatchNbr,WorkOrderNbr,DateTimeAccepting

Q Batch	Work Ord	CurStatus	Accepting	Comments
3345586				
AC	InPrep	WiensN	12/8/03 9:37:06 AM	
SC		WiensN	InPrep 12/8/03 9:37:06 AM	RICHRC5005 REV6
SC		OConnellD	IsBatched 12/11/03 2:57:25 PM	ICOC_RADCALC v4.708
3349625				
AC	InPrep	WiensN	12/17/03 7:37:56 AM	
SC		OConnellD	IsBatched 12/15/03 3:18:40 PM	ICOC_RADCALC v4.708
SC		WiensN	InPrep 12/17/03 7:37:56 AM	RICHRC5005 REV6

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.